

EECS 440 System Design of a Search Engine

Winter 2021

Lecture 18: Ethics

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You spot a valuable painting at a garage sale for \$1. Can you keep that knowledge secret and buy it for \$1?

Probably. But not always.

What if you're an art expert, the seller is aware you're an expert and he's asked you if it's worth anything?

He's relying on you to offer an expert opinion. Whether it's legal or not, you probably shouldn't lie.

You're selling a house and you know the roof leaks and it has carpenter ants. Must you disclose?

Yes. In most (all?) states you must disclose this by law.

You're selling a house with a history: A previous occupant was murdered and there have been stories about ghosts. Must you disclose?

Deaths from natural causes do not have to be disclosed. But each state is different re: suicides, accidents and violent deaths. If it's related to the property, e.g., a drowning in the swimming pool, it has to be disclosed.

Believe it or not, you may also be required to disclose the possibility of ghosts as a "phenomena stigma".

You own a coffee shop promising “the world’s best coffee.”
Could you get in trouble for making a false claim?

No, this is protected as “puffery”, a promotional claim expressing a subjective view that no “reasonable person” would take literally.

A surprise use of the puffery defense.


Powell is being sued for \$1.3B by Dominion Voting Systems.

She has claimed that the company was created in Venezuela to rig elections for Hugo Chavez, who died 8 years ago.

Pro-Trump lawyer says 'no reasonable person' would believe her election lies

Lawyers for Sidney Powell argued conspiracies she laid out constituted legally protected first amendment speech

● **US politics - live coverage**



▲ Sidney Powell in Alpharetta, Georgia, on 2 December 2020. Photograph: Nathan Posner/Rex/Shutterstock

A woman is being beaten right outside your door and you see it happen. What should you do?

Sadly, most people do nothing. Sometimes, there is nothing they can do.

The shocking story of Kitty Genovese who was murdered in Queens, NY, while 38 witnesses listened to her screams but did nothing.

She was returning from work around 2:30 am on Mar 13, 1964 when a man with a knife grabbed her and stabbed her while she screamed.

This was on the front page of The New York Times.

37 Who Saw Murder Didn't Call the Police

Apathy at Stabbing of Queens Woman Shocks Inspector

By MARTIN GANSBERG

For more than half an hour 38 respectable, law-abiding citizens in Queens watched a killer stalk and stab a woman in three separate attacks in Kew Gardens.

Twice the sound of their voices and the sudden glow of their bedroom lights interrupted him and frightened him off. Each time he returned, sought her out and stabbed her again. Not one person telephoned the police during the assault; one witness called after the woman was dead.

That was two weeks ago today. But Assistant Chief Inspector Frederick M. Lussen, in charge of the borough's detectives and a veteran of 25 years of homicide investigations, is still shocked.

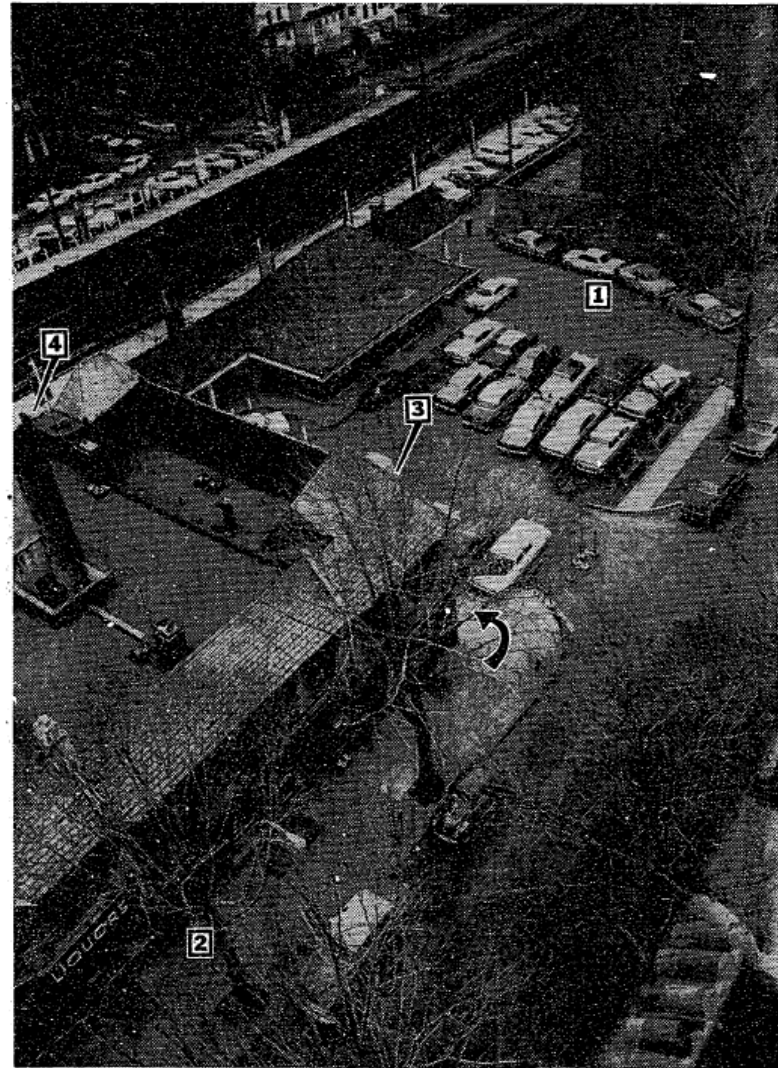
He can give a matter-of-fact recitation of many murders. But the Kew Gardens slaying baffles him—not because it is a murder, but because the “good people” failed to call the police.

“As we have reconstructed the crime,” he said, “the assailant had three chances to kill this woman during a 35-minute period. He returned twice to complete the job. If we had been called when he first attacked, the woman might not be dead now.”

This is what the police say happened beginning at 3:20 A.M. in the staid, middle-class, tree-lined Austin Street area:

Twenty-eight-year-old Catherine Genovese, who was called Kitty by almost everyone in the neighborhood, was returning

Continued on Page 38, Column 1



The New York Times (by Edward Hauser)
At 3:20 A.M. on March 13, Miss Catherine Genovese drove into the parking lot at Kew Gardens railroad station and parked (1). Noticing a man in lot, she became nervous and headed along Austin Street toward a police telephone box. The man caught and attacked her (2) with a knife. She got away, but he attacked her again (3) and again (4).

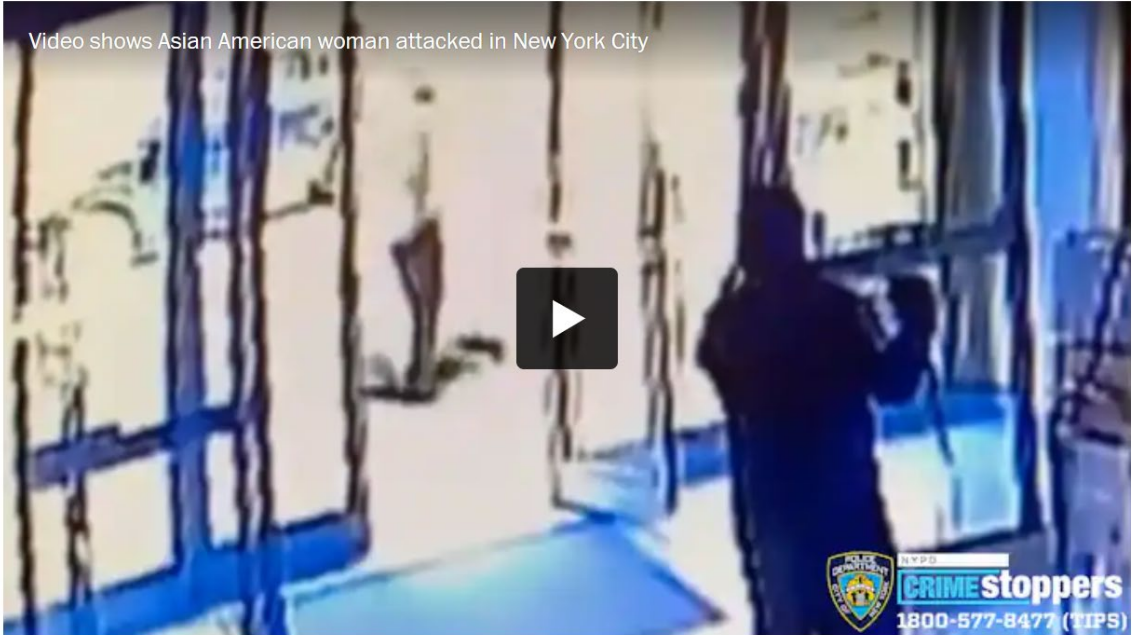
The doormen who watched from inside have been fired.

Washington Post article titled "New York man charged with hate crime in Asian American attack that bystanders watched without helping". The article includes a video showing the attack and a caption stating: "Video shows Asian American woman attacked in New York City". The video is a surveillance recording showing a woman being attacked by a man in a hallway. A play button is overlaid on the video. The video is credited to the NYPD Crime Stoppers, with the phone number 1800-577-8477 (TIPS).

Morning Mix

New York man charged with hate crime in Asian American attack that bystanders watched without helping

Video shows Asian American woman attacked in New York City



CRIME STOPPERS
1800-577-8477 (TIPS)

A woman on her way to church in New York City was attacked by a man who made anti-Asian statements toward her on March 29, according to police. (The Washington Post)

Ethics

What does it mean to be fair?

What does it mean to be ethical?

When do you have specific duties, e.g., a duty to disclose?

What does it mean to be fair?

What does it mean to be fair?

Typical components:

1. Don't take advantage of people.
2. Don't abuse power over others.
3. Treat people equally.
4. Be tolerant.
5. Accept diversity.
6. Be open-minded.
7. Admit mistakes.

What does it mean to be ethical?

This is a tougher question.

What do we mean by ethics?

Ethics

One possible definition:

Moral principles that govern a person's behavior or the conduct of an activity.

Branches of ethics

Normative: How individuals figure out the correct moral action.

Meta-ethics: The nature of ethical properties and judgements, e.g., truth, theory of moral principles.

Applied ethics: Applying theories to everyday life, e.g., should abortion be legal, should you report illegal behavior?

Moral ethics: How individuals develop morally, why morality differs between cultures, what is universal?

Descriptive or Scientific: How do people actually behave?

Within applied ethics

Business ethics: Business policies and practices regarding corporate governance, insider trading, bribery, discrimination, social responsibility, fiduciary responsibility, often set by law.

Professional ethics: Standards of behavior for a professional person, often written out as a code of ethics by a professional organization like the IEEE or set by law.

Personal ethics: What an individual believes about morality and right and wrong.

Concepts

Information asymmetry: When one party has more or better information than the other and could take advantage of the other.

Reliance: When one party to an agreement acts or changes their position based on the other's claims.

Fiduciary responsibility: A duty to act in the best interest of another.

Duty to disclose: A legal obligation to disclose information that may be contrary to your interests, e.g., known defects in a house you're selling.

Professional ethics

Define standards of behavior for people working within a profession.

Generally designed to address the problems of information asymmetry and reliance.

Often written out as a code of ethics.

Examples

IEEE Code of Ethics

AMA Code of Medical Ethics

Society of Professional Journalists Code of Ethics

7.8 IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology; its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

AMA CODE OF MEDICAL ETHICS

Preamble

The medical profession has long subscribed to a body of ethical statements developed primarily for the benefit of the patient. As a member of this profession, a physician must recognize responsibility to patients first and foremost, as well as to society, to other health professionals, and to self. The following Principles adopted by the American Medical Association are not laws, but standards of conduct that define the essentials of honorable behavior for the physician.

Principles of medical ethics

- I. A physician shall be dedicated to providing competent medical care, with compassion and respect for human dignity and rights.
- II. A physician shall uphold the standards of professionalism, be honest in all professional interactions, and strive to report physicians deficient in character or competence, or engaging in fraud or deception, to appropriate entities.
- III. A physician shall respect the law and also recognize a responsibility to seek changes in those requirements which are contrary to the best interests of the patient.
- IV. A physician shall respect the rights of patients, colleagues, and other health professionals, and shall safeguard patient confidences and privacy within the constraints of the law.
- V. A physician shall continue to study, apply, and advance scientific knowledge, maintain a commitment to medical education, make relevant information available to patients, colleagues, and the public, obtain consultation, and use the talents of other health professionals when indicated.
- VI. A physician shall, in the provision of appropriate patient care, except in emergencies, be free to choose whom to serve, with whom to associate, and the environment in which to provide medical care.
- VII. A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health.
- VIII. A physician shall, while caring for a patient, regard responsibility to the patient as paramount.
- IX. A physician shall support access to medical care for all people.

Society of Professional Journalists Code of Ethics

1. Seek Truth and Report It.
2. Minimize Harm.
3. Act Independently.
4. Be Accountable and Transparent.

Seek Truth and Report It

Ethical journalism should be accurate and fair. Journalists should be honest and courageous in gathering, reporting and interpreting information.

Journalists should:

- Take responsibility for the accuracy of their work. Verify information before releasing it. Use original sources whenever possible.
- Remember that neither speed nor format excuses inaccuracy.
- Provide context. Take special care not to misrepresent or oversimplify in promoting, previewing or summarizing a story.
- Gather, update and correct information throughout the life of a news story.
- Be cautious when making promises, but keep the promises they make.
- Identify sources clearly. The public is entitled to as much information as possible to judge the reliability and motivations of sources.
- Consider sources' motives before promising anonymity. Reserve anonymity for sources who may face danger, retribution or other harm, and have information that cannot be obtained elsewhere. Explain why anonymity was granted.
- Diligently seek subjects of news coverage to allow them to respond to criticism or allegations of wrongdoing.
- Avoid undercover or other surreptitious methods of gathering information unless traditional, open methods will not yield information vital to the public.
- Be vigilant and courageous about holding those with power accountable. Give voice to the voiceless.
- Support the open and civil exchange of views, even views they find repugnant.
- Recognize a special obligation to serve as watchdogs over public affairs and government. Seek to ensure that the public's business is conducted in the open, and that public records are open to all.
- Provide access to source material when it is relevant and appropriate.
- Boldly tell the story of the diversity and magnitude of the human experience. Seek sources whose voices we seldom hear.
- Avoid stereotyping. Journalists should examine the ways their values and experiences may shape their reporting.
- Label advocacy and commentary.
- Never deliberately distort facts or context, including visual information. Clearly label illustrations and re-enactments.
- Never plagiarize. Always attribute.

The intersection of ethics and CS

We are entering a world where everything will be captured somewhere as digital data.

Electronic surveillance is happening.

You'll likely be on camera and recorded much of your waking life.

Your cellphone will provide a GPS record of where you went.

The government and others may be monitoring your electronic conversations.

Certainly, anything you voluntarily post or share will never go away.

The intersection of ethics and CS

As computer scientists and engineers, you will decide how society uses your work.

Cameras are now everywhere.



13 ACTION NEWS

THEFT CAUGHT ON CAMERA

13 ACTION NEWS

STATION CASINOS

FORECASTS

U.S. NEWS

IS AT NOON TO MARK ONE YEAR SINCE WORST MASS SHOOTING

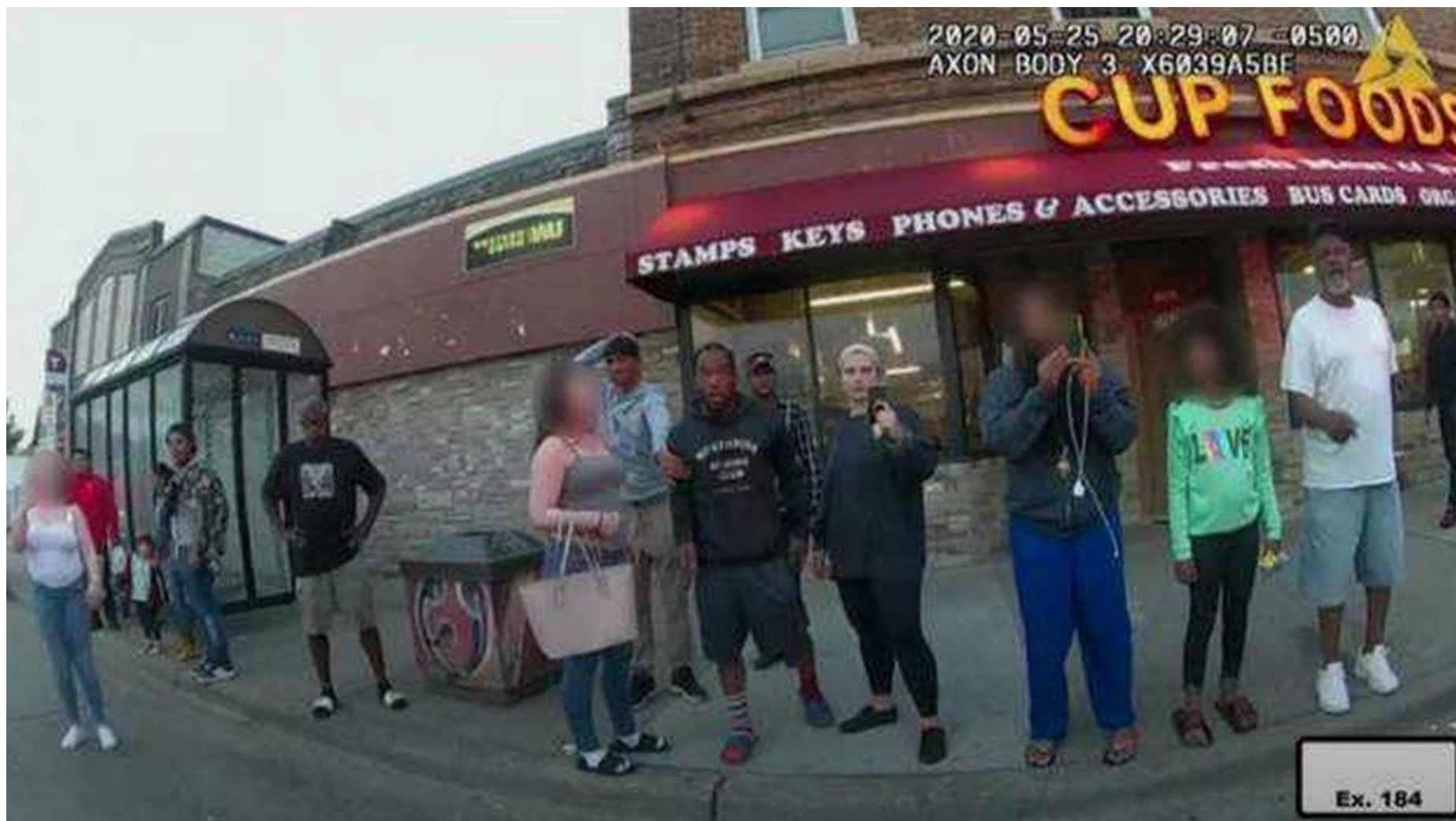
4:59

80°

Derek Chauvin,
kneeling on George
Floyd's neck, caught
on cellphone.



The witnesses, caught on Derek Chauvin's bodycam.




Governments spy on us.

Snowden revealed that the NSA was conducting mass surveillance on Americans' telephone records in 2013.

U.S. court: Mass surveillance program exposed by Snowden was illegal

MEDIA AND TELECOMS SEPTEMBER 2, 2020 / 6:20 PM / UPDATED 7 MONTHS AGO

By Raphael Satter 3 MIN READ



Waiting for signal-metrics-collector-beta.s-onetag.com...

China used electronic surveillance during the pandemic to enforce stay at home orders.

But they've also used it for other purposes.

China using surveillance firms to help write ethnicity-tracking specs

the japan times
THE INDEPENDENT VOICE IN ASIA


14°C CLEAR
TOKYO (12 a.m.)
TODAY'S PRINT EDITION

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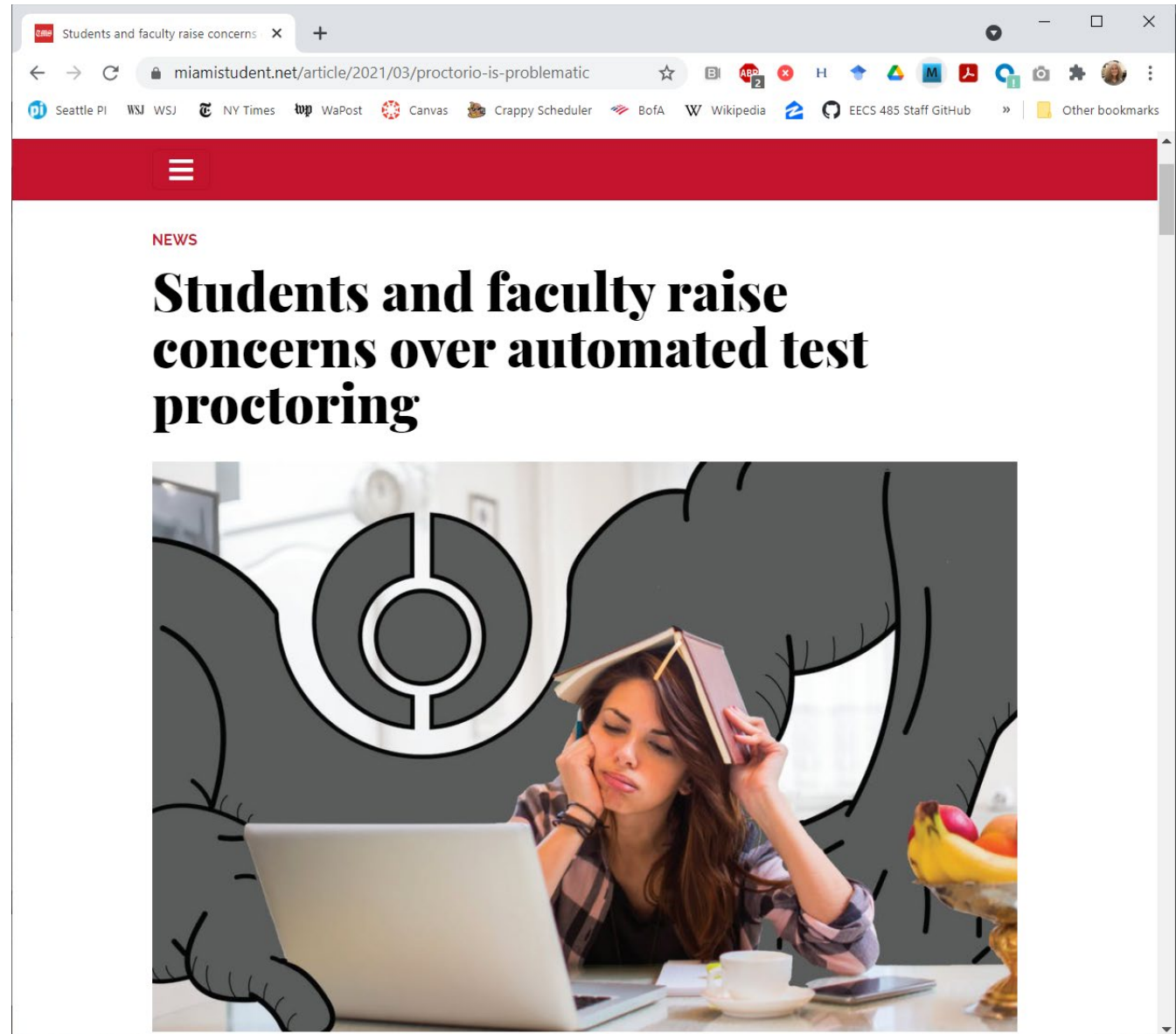
ASIA PACIFIC

China using surveillance firms to help write ethnicity-tracking specs



Surveillance cameras monitor the area in front of a portrait of the late Chinese chairman Mao Zedong on Tiananmen Gate in Beijing. | REUTERS

Cameras and other proctoring techniques were briefly considered last spring here at UMich.



Facial recognition is being more widely used, especially by police.

It's not always right.

Wrongfully Accused by an Algorithm


nytimes.com/2020/06/24/technology/facial-recognition-arrest.h...

TECHNOLOGY | Wrongfully Accused by an Algorithm

Wrongfully Accused by an Algorithm

In what may be the first known case of its kind, a faulty facial recognition match led to a Michigan man's arrest for a crime he did not commit.

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 By [Kashmir Hill](#)

Published June 24, 2020 Updated Aug. 3, 2020

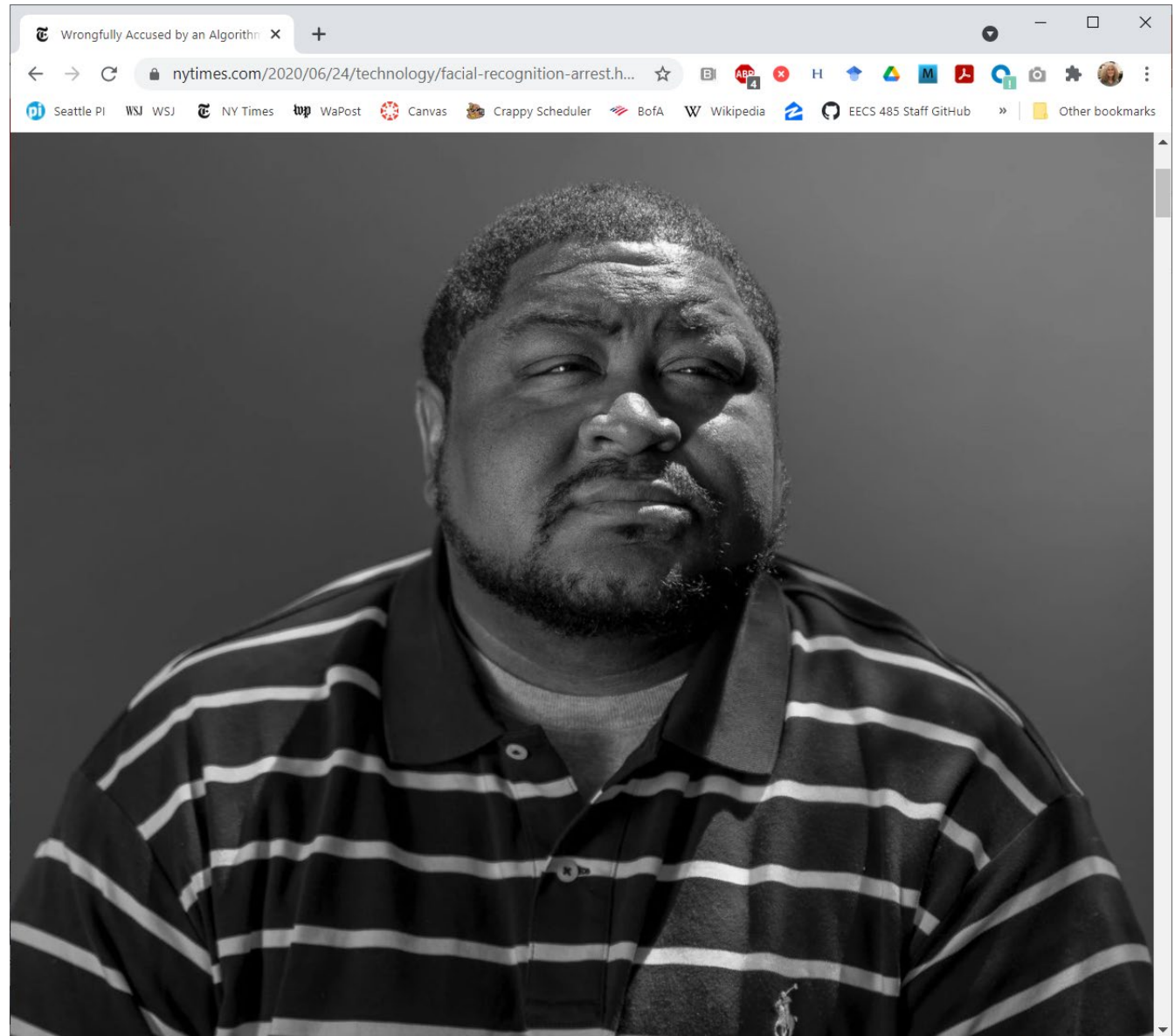
SIGN UP FOR THE GREAT READ: *Every weekday, we recommend one piece of exceptional writing from The Times — a narrative or essay that takes you someplace you might not expect to go.*

[Sign Up](#)

Note: In response to this article, the Wayne County prosecutor's office said that Robert Julian-Borchak Williams could have the case

This was the individual.

Facial recognition software tends to be less accurate with people of color.



Who is looking out for us?

Google recently fired the young Black woman they'd hired to build their Ethical AI team after she criticized their approach to minority hiring.

Who Is Making Sure the A.I. Machine... x +

nytimes.com/2021/03/15/technology/artificial-intelligence-goog... ☆

Seattle PI WSJ WSJ NY Times WaPost Canvas Crappy Scheduler BofA Wikipedia EECS 485 Staff GitHub Other bookmarks

TECHNOLOGY | Who Is Making Sure the A.I. Machines Aren't Racist?

Who Is Making Sure the A.I. Machines Aren't Racist?

When Google forced out two well-known artificial intelligence experts, a long-simmering research controversy burst into the open.

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By Cade Metz

March 15, 2021

Listen to This Article

10 ▶ 10 Listen 18:52 🔊

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Speaks for itself.

Google Removes 'Don't Be Evil' Clause

gizmodo.com/google-removes-nearly-all-m...

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GOOGLE

Google Removes 'Don't Be Evil' Clause From Its Code of Conduct

 Kate Conger
5/18/18 5:31PM

363 28



narrative or essay that takes you someplace you might not

Anything you post will never go away.

This was a comment about oversampling in CD players that I posted to the net.audio Usenet group in July 23, 1985. It's still there on the web.

(Thank goodness I was right.)

The screenshot shows a web browser window with two tabs: "Google Removes 'Don't Be Evil' Clau..." and "Media Diligence". The address bar shows a Google Groups URL. The browser's bookmark bar includes links to Seattle PI, WSJ, NY Times, WaPost, Canvas, Crappy Scheduler, BofA, Wikipedia, and "Other bookmarks". The Google Groups interface shows a post by Douglas Hamilton to the net.audio Usenet group on July 23, 1985, at 4:13:28 PM. The post content is as follows:

...
> Quote from a news article about Compact Discs
>
> Another item for buyers to ask about is oversampling,
> which is the ability of the player to ask the disc for
> information more often than necessary.
>
> "What makes the difference in sound at this level is how
> hard the computer is working to translate," Harvey said.
> Oversampling allows the microcomputer to cover up damaged
> information by overplaying the material just before it
> to cover up.
>
> So THAT's how they do it!

No, it's not. Oversampling refers to interpolating between the samples actually recorded on the disk.

CD's are recorded with a 44KHz sampling rate which (remembering your sampling theory) gives a 22KHz bandwidth. The problem is that if one feeds the samples directly to the DAC's, the output "staircases" from one sample to the next.

It's desirable to remove this high frequency "switching" noise but of course any kind of low-pass filtering causes phase shift near the cutoff frequency (also undesirable.) To minimize this effect, some CD manufacturers interpolate much the way you would with a trig table (remember before calculators?) to find intermediate values. By creating "samples" at an 88 or 176KHz rate to be fed to the DACs, they've moved the noise up to a much higher frequency, more removed from the

Alexi McCammond
was hired, then fired
after anti-Asian
Tweets she'd posted
as college freshman a
decade earlier
surfaced.

Alexi McCammond, Teen Vogue Edit

nytimes.com/2021/03/18/business/media/teen-v...

Seattle PI WSJ NY Times WaPost Canvas Crappy Scheduler BofA Wikipedia Other bookmarks

Today in Business Latest Updates New Hong Kong Courts the Rich Ikea On Trial for 'Espionage' A Better Way to Train Workers

Teen Vogue Editor Resigns After Fury Over Racist Tweets

The hiring of Alexi McCammond, who was supposed to start at the Condé Nast publication next week, drew complaints because of racist and homophobic tweets she had posted a decade ago.


f WhatsApp Twitter Email Share Bookmark

A photograph of Alexi McCammond, a woman with long dark hair, wearing a patterned blazer. She is seated at a table with a microphone and a water bottle, gesturing with her right hand while speaking. The background is a plain, light-colored wall.

Capitol rioters were
undone by their own
selfies.

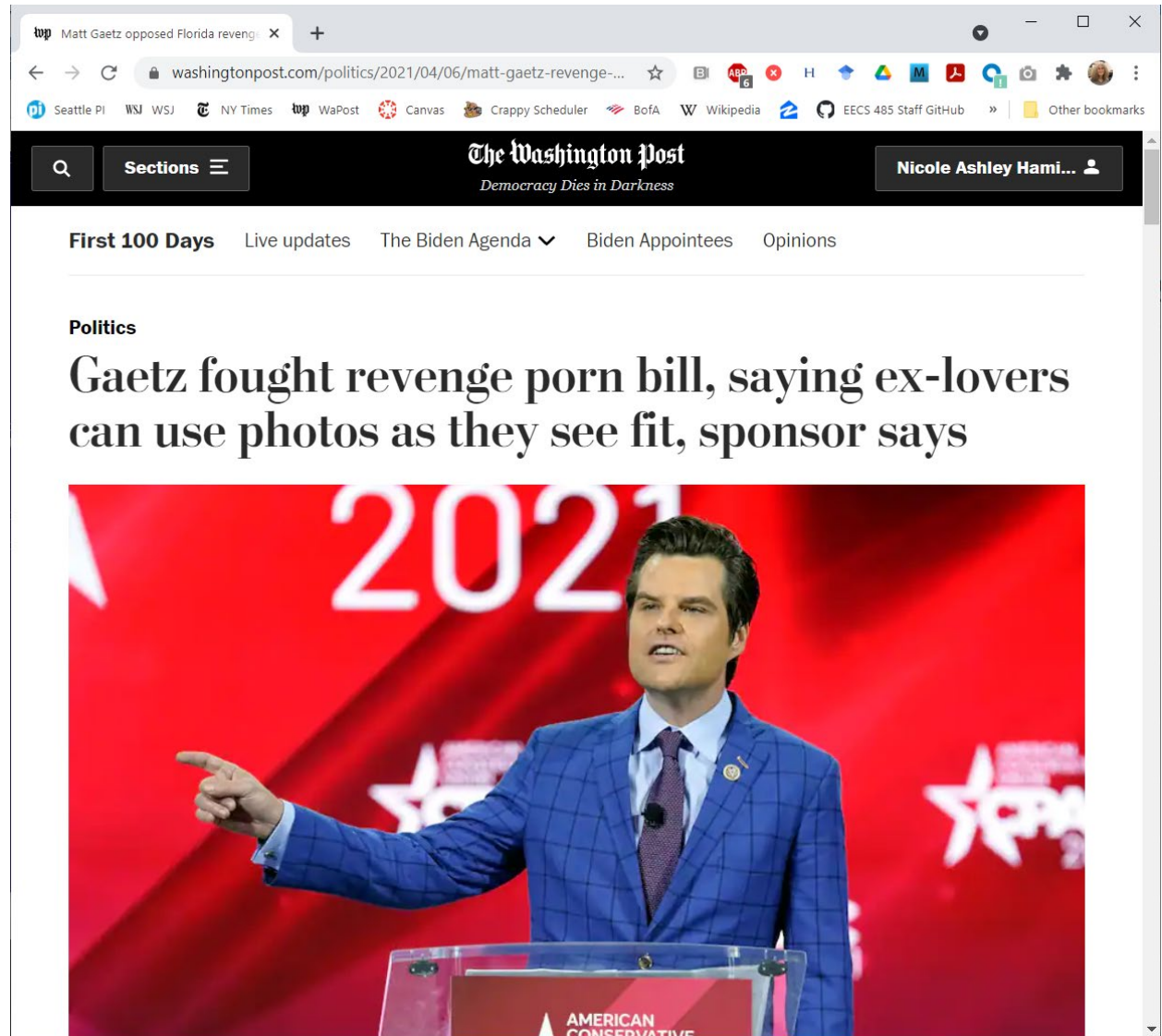
Police let most Capitol rioters walk away. But cellphone data and videos could now lead to more arrests.

Think rioters walked away scot free? Not so fast, say police with potent technology ready to name names.



The image is a screenshot of a web browser displaying a Washington Post article. The browser's address bar shows the URL 'washingtonpost.com/technology/2021/01/08/tru...'. The page header includes the Washington Post logo and the tagline 'Democracy Dies in Darkness'. The article is categorized under 'Technology' and has a sub-header 'Police let most Capitol rioters walk away. But cellphone data and videos could now lead to more arrests.' The main text begins with 'Think rioters walked away scot free? Not so fast, say police with potent technology ready to name names.' Below the text is a photograph of a group of people, some wearing 'TRUMP' hats and masks, inside a building with large portraits on the walls. A police officer is visible in the foreground, facing the group.

Gaetz is reported to have shown nude videos of his sexual partners to other members of Congress.



How will you know
what is real?

What Are Deepfakes and How Are They Created?

spectrum.ieee.org/tech-talk/computing/software/what-are-dee...

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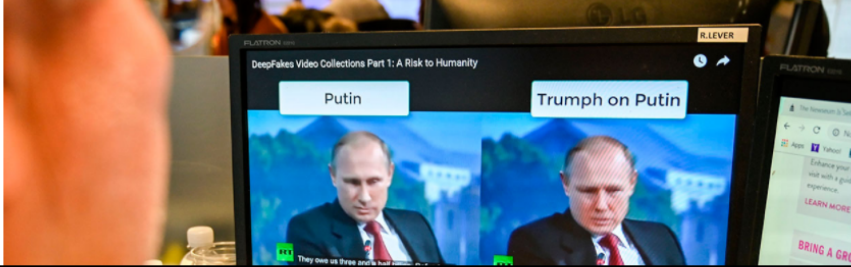
Tech Talk | Computing | Software

29 Apr 2020 | 16:00 GMT

What Are Deepfakes and How Are They Created?

Deepfake technologies: What they are, what they do, and how they're made

By Sally Adee



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By aggregating enough data from enough public and private sources allows a lot of personal information to be revealed.

The dangers of data collection | BCS

bcso.org/content-hub/the-dangers-of-data-collec...


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bcso
The Chartered Institute for IT

Content hub > Article

The dangers of data collection

Data mining is being used to target individuals, both by advertisers and organised crime. Andy Smith FBCS CITP examines the role played by data aggregation.



Court records are public. But you had to go there and do the search yourself. Now websites will do it for you.

Yes, those are all relatives.

Compiling Your Report For Nicole H. x +

checkpeople.com/landing/people/e1m3d7c9/op...

Seattle PI WSJ NY Times WaPost Canvas Crappy Scheduler BofA Wikipedia Other bookmarks

TrustedSite CERTIFIED SECURE McAfee SECURE Norton SECURED VeriSign HACKER SAFE

STEP 1 > STEP 2 > STEP 3

Search Subject
Nicole Hamilton

Age
70 years old

Location History
Ann Arbor, MI,
Redmond, WA,
Needham Heights, MA,
[Show 9 more](#)

Likely Relatives
Alva Hamilton,
Carol Hamilton,
Carol Hamilton,
[Show 2 more](#)

BUILDING REPORT

Likely Relatives

Our database search has found the following relatives for Nicole Hamilton.

Notice: We recommend you select all of the relatives below to include them in your report!

☐ Alva Hamilton ☐ Carol Hamilton

☐ Carol Hamilton ☐ Jeffrey Hamilton

☐ Mark Hamilton

CONTINUE TO REPORT

Confirm Information

Do you think Nicole has ever had a DUI?

YES **NO**

I DON'T KNOW

We respect your privacy!

There's now an industry of companies that will clean up your online presence.

The screenshot shows the ReputationDefender website in a web browser. The browser's address bar displays 'reputationdefender.com'. The website's header includes the company logo, a phone number '855-462-7166', and navigation links for 'Live Chat', 'Contact Us', and 'Log In'. The main content area features a large headline 'Concerned with something online? We can help.' followed by a list of services: 'Fix your search results', 'Remove personal information', and 'Manage business reviews'. Below this, there are two primary calls to action: 'TALK TO AN EXPERT' with a phone button and 'GET YOUR FREE REPUTATION CONSULTATION' with a 'FREE CONSULTATION' button. A chat bubble on the right side of the page contains a woman's profile picture and the text 'Hi there! Can I answer any questions for you about ReputationDefender?' with 'YES, LET'S CHAT' and 'No thanks' buttons. The footer section, titled 'FEATURED IN:', displays logos for 'WIRED', 'WSJ', 'abc', 'The New York', and '60'.

ReputationDefender | Online Reputa x +

reputationdefender.com

Seattle PI WSJ WSJ NY Times WaPost Canvas Crappy Scheduler BofA Wikipedia Other bookmarks

Live Chat Contact Us Log In

REPUTATION DEFENDER

855-462-7166

Concerned with something online? We can help.

- ✓ Fix your search results
- ✓ Remove personal information
- ✓ Manage business reviews

TALK TO AN EXPERT

855-462-7166

or

GET YOUR FREE REPUTATION CONSULTATION

FREE CONSULTATION

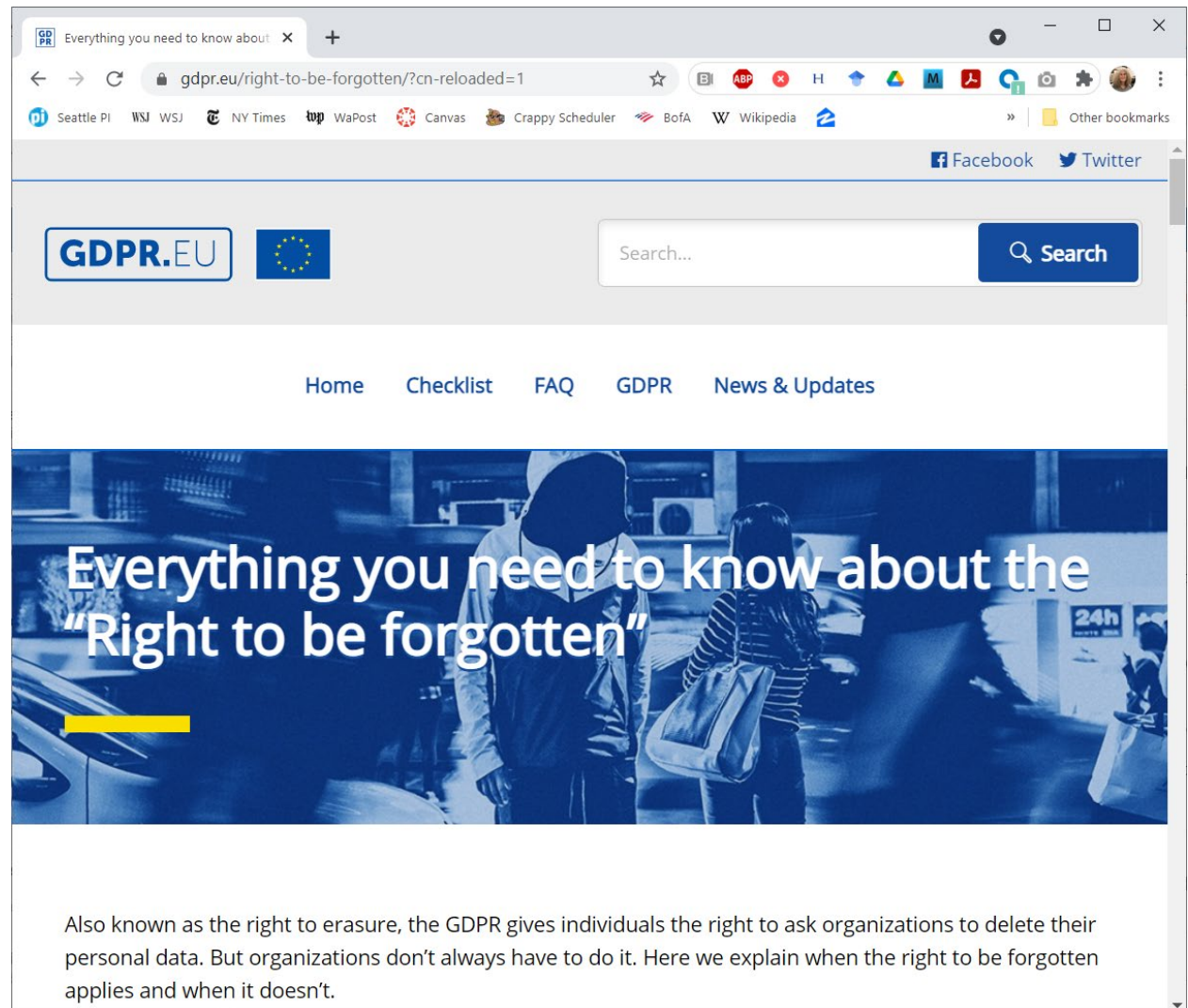
Hi there! Can I answer any questions for you about ReputationDefender?

YES, LET'S CHAT No thanks

FEATURED IN: WIRED WSJ abc The New York 60

Europe recognizes a right to be forgotten.

The US does not.



The screenshot shows a web browser window with the URL `gdpr.eu/right-to-be-forgotten/?cn-reloaded=1`. The browser's address bar and tabs are visible at the top. The website header includes the **GDPR.EU** logo, the European Union flag, a search bar, and social media links for Facebook and Twitter. A navigation menu contains links for Home, Checklist, FAQ, GDPR, and News & Updates. The main content area features a large blue-tinted image of two people in a store, with the title "Everything you need to know about the 'Right to be forgotten'" overlaid in white text. A yellow rectangular redaction mark is positioned over the first few letters of the word "Everything". Below the image, a paragraph of text explains the right to erasure under the GDPR.

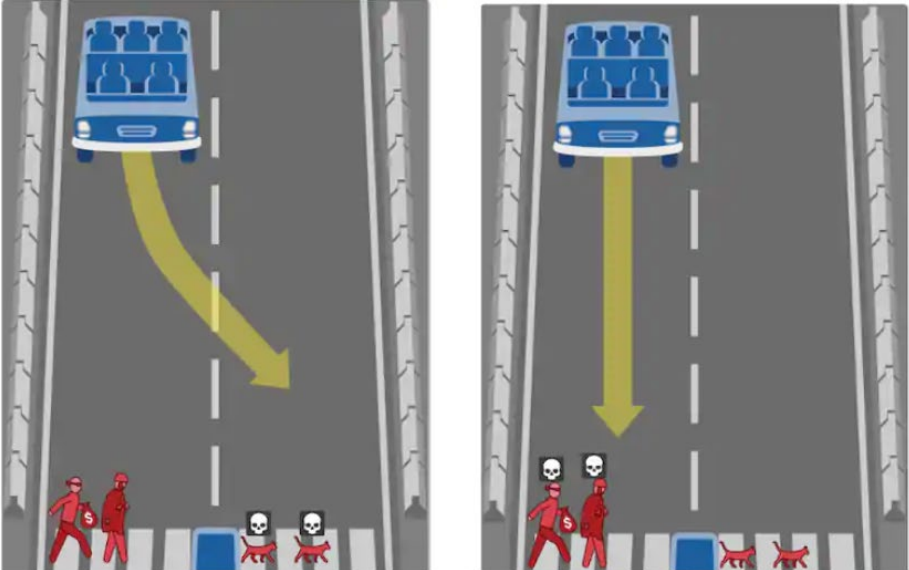
Everything you need to know about the "Right to be forgotten"

Also known as the right to erasure, the GDPR gives individuals the right to ask organizations to delete their personal data. But organizations don't always have to do it. Here we explain when the right to be forgotten applies and when it doesn't.

Cars will decide who should live.

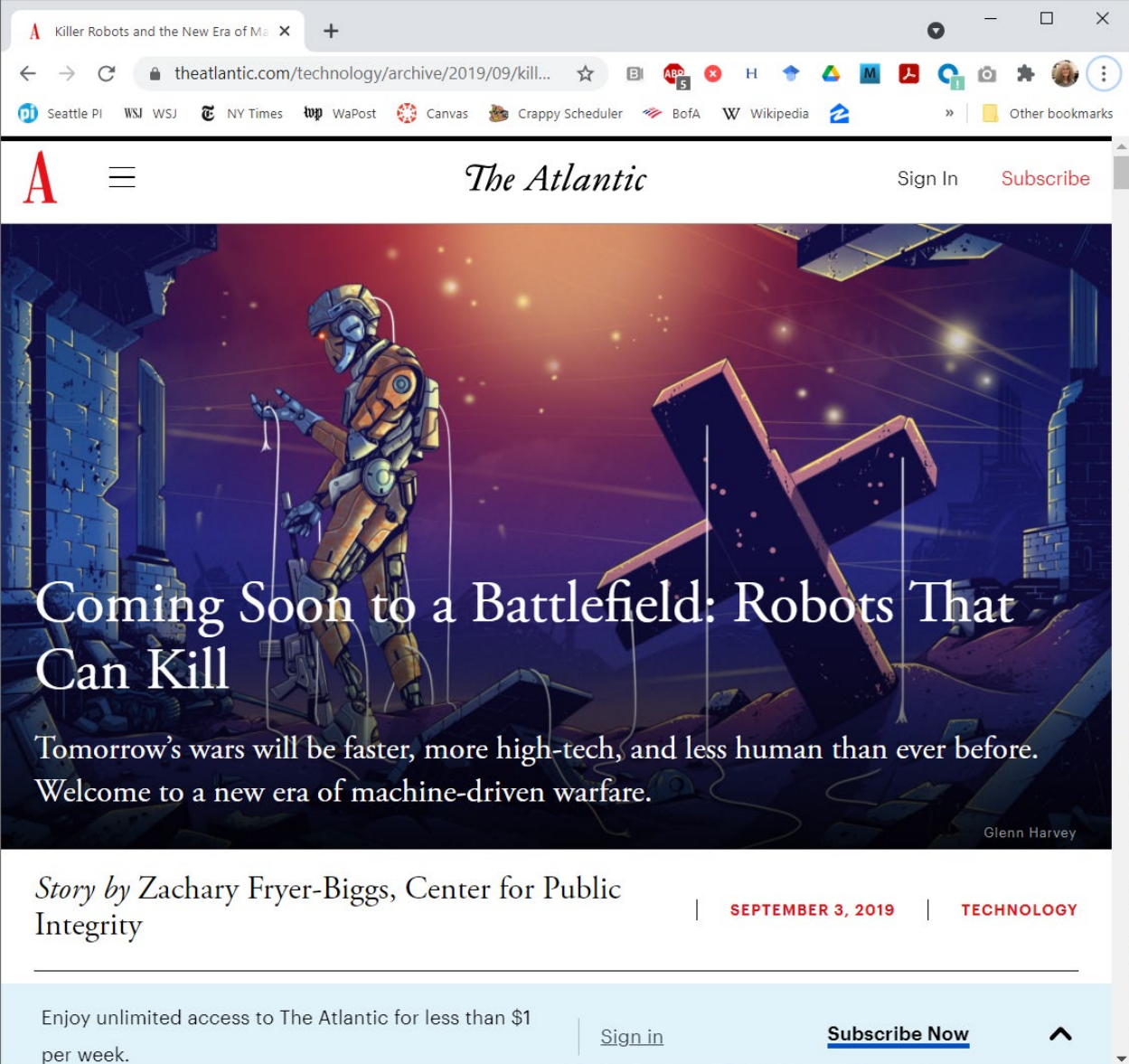
Self-driving cars will have to decide who should live and who should die. Here's who humans would kill.

What should the self-driving car do?



The image displays a screenshot of a web browser showing a news article from The Washington Post. The browser's address bar shows the URL 'washingtonpost.com/science/2018/10/24/self-dr...'. The page header includes the Washington Post logo and the tagline 'Democracy Dies in Darkness'. The article is categorized under 'Science' and is titled 'Self-driving cars will have to decide who should live and who should die. Here's who humans would kill.' Below the title, a sub-header asks 'What should the self-driving car do?'. The main content area features two side-by-side illustrations of a self-driving car approaching a crosswalk. In the left illustration, the car is positioned to swerve right, indicated by a yellow arrow, to avoid two children. In the right illustration, the car is positioned to swerve left, indicated by a yellow arrow, to avoid two pedestrians, one of whom is carrying a money bag.

And real terminators
will decide who
should die.




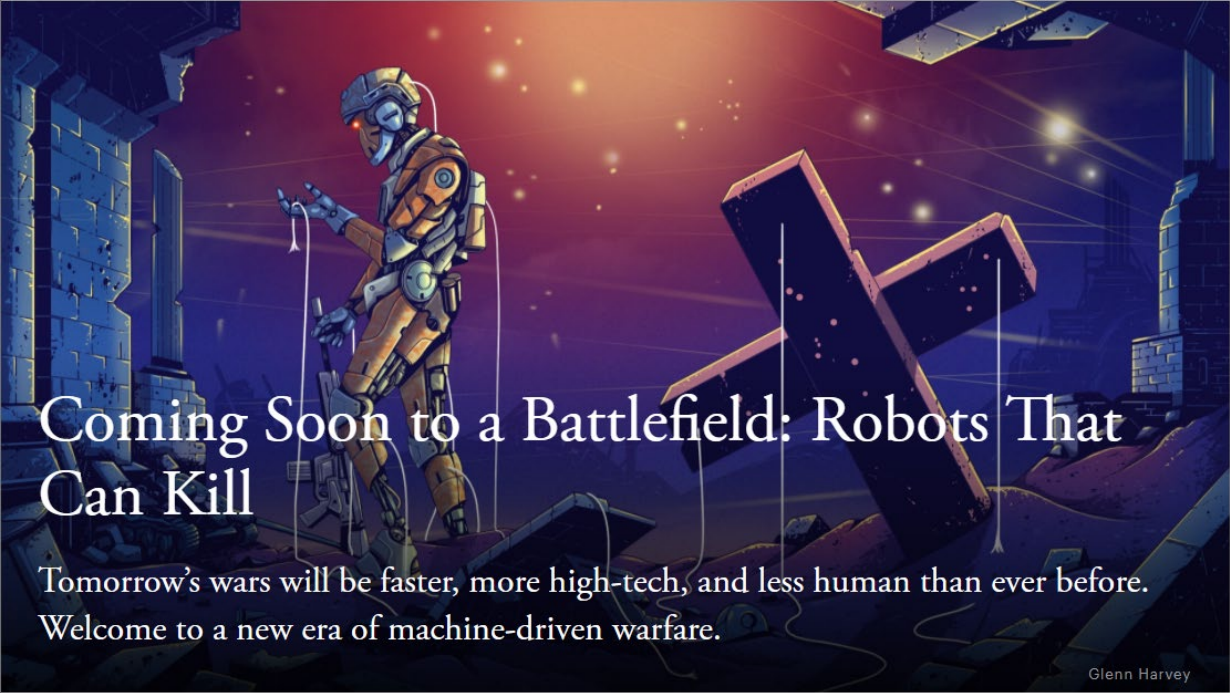
The screenshot shows a web browser window with a single tab titled "Killer Robots and the New Era of Me...". The address bar shows the URL "theatlantic.com/technology/archive/2019/09/kill...". The browser's bookmark bar contains various sites like Seattle PI, WSJ, NY Times, WaPost, Canvas, Crappy Scheduler, BofA, Wikipedia, and others. The The Atlantic website header is visible, featuring the logo, a menu icon, the name "The Atlantic", and links for "Sign In" and "Subscribe". The main content area features a large, dark illustration of a humanoid robot in a battlefield setting, holding a weapon. Overlaid on the illustration is the article title "Coming Soon to a Battlefield: Robots That Can Kill" in a large, white, serif font. Below the title is a subtitle in a smaller, white, serif font: "Tomorrow's wars will be faster, more high-tech, and less human than ever before. Welcome to a new era of machine-driven warfare." The artist's name "Glenn Harvey" is in the bottom right corner of the illustration. Below the illustration, the text "Story by Zachary Fryer-Biggs, Center for Public Integrity" is displayed. To the right of this text are two red links: "SEPTEMBER 3, 2019" and "TECHNOLOGY". At the bottom of the page, a light blue banner contains the text "Enjoy unlimited access to The Atlantic for less than \$1 per week." followed by a "Sign in" link and a "Subscribe Now" button with a right-pointing arrow.

Killer Robots and the New Era of Me...

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Tomorrow's wars will be faster, more high-tech, and less human than ever before. Welcome to a new era of machine-driven warfare.

Glenn Harvey

Story by Zachary Fryer-Biggs, Center for Public Integrity

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